REMARKS

The rejection of claim 15 under 35 USC 112, first paragraph, as failing to comply with the written description requirement, is respectfully traversed.

Applicant has cancelled claim 15 but has included the limitations set forth in claim 15 in amended claim 1 and accordingly will treat this rejection as a rejection of claim 1.

Applicant has reviewed Table 4 and the contents of claim 15 and simply does not understand the allegation of the Examiner "that the recited properties in claim 15 are not supported by Table 4". What specific properties is the Examiner referring to as lacking support? We believe the Examiner is in error and may be relying on the comparative data in Table 4, which applicant is not claiming.

Applicant believes that the subject matter of minimum creep rate and minimum tensile strength are clearly supported in the application as originally filed and that the rejection of claim 15, now combined with claim 1, under 35 USC 112 should be withdrawn.

The rejection of claims 1, 4-8, 11, 14, 15, 21, 24 and 25 under 35 USC 103 as being unpatentable over Bronfin (USP 6139651) is respectfully traversed. It should be noted that claims 21, 24 and 25 have now been cancelled, leaving only claims 1, 4-8, 11, 12 and 14, pending in the application.

Applicant has amended claim 1 to further limit the magnesium based alloy composition of the present invention to a specific minimum creep rate and minimum tensile strength as presented earlier in claim 15, now cancelled. In addition, claim 1 specifies a known field of use, viz., high pressure die casting and a criteria of utility for the claimed composition, i.e., that it must have good castability. This is significant in that the Decaration of Applicant substantiates that some of the cited references cannot provide a castable product.

The following "Table" documents the differences between the compositional elements of the subject application and all of the cited references, which the Examiner is relying upon in rejecting the claims. The Table does not include the current limitations which have been added to claim 1, as ameded, relative to minimum creep rate and minimum tensile

strength and does not reflect or provide any indication of the abiltity of the composition to be useful for high pressure die casting with good castability.

TABLE

Element	Instant Appln.	Bronfin S/51	Ohori US/20	Lefebvfre S/80	JP '348
Al	6.1-9.2 wt.%	4.5-10 5.0-8.9*	2-6 3-5*	1-12 4.8-5.3*	1-9.5 or Zn or Ag not exemplifi ed
Mn	0.08-0.38 wt.%	0.15-1.0 ~0.3*	0.1-1 0.1-0.9*	0-0.5 0.3*	0-1.5 or Zr not exemplified
Ca	0.2-1.2 wt.%	~0.25-1.2 0.45-1.08*	0.3-2 0.3-2*	0.1-0.5 0.11-0.32*	0.5-5 not exemplified
Sr	0.2-1.4 wt.%	0.01-0.2 0.03-0.13*	0.01-1 0.1-1*	0.1-0.6 0.3-0.56*	0-1.5 or Sc or Y not exemplified
Zn	0-0.9 wt.%	0.01-1 or 5-10 0.7-7.3*	0.2-1 0-0.6*	0-0.4 0.004-0.008*	1-9.5 or Al or Ag not exemplified
rare earth	0-0.8 wt.%	0.05-1 0.12-0.92*	0.1-3 0-2.9*	0	0.5-5 not exemplified
Zr	0-0.02 wt.%	-	-	-	0-1.5 or Mn not exemplified
Be	0-0.0004 wt.%	0.0005-0.0015 0.0007-0.0011*	-	-	-
Ca+ Sr	≥0.9 wt.%				-
Si	0-0.03 wt.%	0-0.05 0.01*	0.1-1 0.2-0.6*	0-0.05 0.004-0.071*	-

*range supported by Examples

From the above Table, it is clear that the reference Bronfin et al '651 teaches a composition with a low content of strontium and a minimum concentration of beryllium which exceeds the maximum requirement set forth in claim 1. In column 5 line 15 of Bronfin et al "no less than 0.0005% of Be" is specifically taught as needed to prevent oxidation of the melt. Be is not essential to the composition of the subject composition and is deleterious to the performance of the composition when it exceeds 4ppm, i.e., 0.0004% by weight. The Examiner has chosen to disregard factual evidence and instead to create his own illusion of

the facts by stating that a difference of 0.0001 wt% "is close enough" that one of ordinary skill would have expected them to have the same properties citing case law to support this. However, the facts here clearly show that a difference of 0.0001wt% is "not close enough" in that Bronfin et al makes this point clear and the Examiner must accept this. The Examiner is not at liberty to make up his own facts and then to cite case law to support a naked allegation which is based upon erroneous unsupported facts.

As explained above, Bronfin et al does not teach a magnesium based alloy composition having the properties of minimum creep rate and minimum tensile strength as set forth in claim 1 and does not teach or suggest usefulness of the composition for the application of high pressure die casting and/or to achieve good castability. In this regard, the Examiner refers to col 5 lines 48-62 of Bronfin for creep properties when in fact this is a teaching by Bronfin of the inability to exceed temperatures of about 135°C and not to use temperatures at or above 150°C. Moreover, no suggestion of how to achieve a minimum creep rate at 150°C of no higher than 3.2×10^{-9}/s under the stress of 50 MPa is present in Bronfin et al.

The Examiner in support of his rejection, makes the generalized statement that "Bronfin discloses the features including the claimed magnesium based alloy composition and intermetallic compounds as is claimed by applicant". This is simply not the case.

In a multi-parameter magnesium based alloy system, a skilled person can hardly learn how to select elements to achieve desired properties since it is well known that even minor differences in amounts can contribute to significantly different behaviors of the mixtures. Not only is the generalized statement of the Examiner in error, but in view of what is known to those skilled in the art relating to the effect on the behavior and properties of the Mg based alloy system for even a very minor difference in composition the Examiner is, in effect, contradicting those skilled in the art. For this to have merit, the Examiner must come forth with support other than simply an allegation. More specifically, as noted in the above Table, the reference Bronfin et al teaches that the content of strontium should not exceed 0.2 wt.% and, as evidenced in the examples and from the teaching in the examples Sr is limited to no more than 0.13% by weight. In addition, Bronfin et al teaches a minimum beryllium concentration which exceeds the maximum set forth in claim 1 and in fact, teaches using up to 15 ppm Be with a preferred range of 7-11 ppm. The maximum Be concentration in the

subject application is 4 ppm and the minimum strontium content is 0.2 wt. %. How can the Examiner argue contrary to the teaching in the reference that this difference is not significant?

The declaration submitted by Applicant under 35 USC 132, clearly substantiates the unexpected results of the instant application for achieving a minimum creep rate in combination with a given minimum tensile strength and the importance of good castability for high pressure casting . The cited references do not teach this or suggest what combination of elements and in what percent they should be used to realize a minimum creep rate in combination with a given minimum tensile strength and do not relate to or discuss the application of high pressure casting and good castability.

It should be noted that Applicant is a co-inventor of the Bronfin reference and has stated in the declaration of record that the alloys in the Bronfin reference, from a physical metallurgical point of view, are distinctly different from the composition of the subject invention. There is no basis for the Examiner not to take into account a sworn statement of Applicant that his own prior art teaching has a distinctly different metallurgy from the composition of the subject invention. The fact that the Bronfin reference does not provide a creep rate in combination with a minimum yield strength as taught in claim 1 is, of itself, factual evidence of non-obviousness. For the Examiner to allege otherwise, contradicts applicant without any support from the prior art teaching of Bronfin. More specifically, Bronfin teaches a minimum of 5 ppm Be and indicates a preferred minimum of at least 7 ppm. This will result in a significantly different mixture. Furthermore, Applicant in his Declaration has substantiated the above-noted differences between the composition of the subject application and that of Bronfin et al as well as the other references cited by the Examiner, and has also shown that unexpected results exists, based on the comparative tests. The Examiner instead argues that despite the teaching in the examples of Bronfin et al the maximum recited content for Sr is 0.2wt% which is equal to the minimum teaching in the subject application and that the teaching of Be in Bronfin et al is only 0.0001wt% different from the maximum teaching in claim 1, and that this is "close enough" to support a presumption of obviousness. A difference of 1ppm may, in a mathematical context, appear to be a small difference, but is significant in light of applicants Declaration and what is known to those skilled in this art and contributes to a substantial difference in creep rate and tensile strength. Moreover, how

would one know from the teaching in Bronfin, to choose the lowest Sr content and to go below the minimum teaching for Be without having applicants specification before him? Accordingly, no basis exists to consider this "close enough" to create a presumption of obviousness, without support from the reference. The Examiner is required to substantiate his allegation by evidence and not by other naked allegations of what is "close enough". Accordingly, the Examiner has not made out a prima facie case of obviousness and the rejection of claims 1, 4-11, 14, 15, 21, 24 and 25 as being unpatentable over Bronfin '651, should be withdrawn.

The rejection of claims 1, 4-8, 12, 14, 15, 21, 24 and 25 under 35 USC 103 as being unpatentable over Ohori et al (USP 2001/0023720) is respectfully traversed. The Examiner admits that the claimed subject matter and the teaching in Ohori is not the same but despite this argues that the difference would have been inherently possessed since the difference relates to intermetallic compounds. This is a false statement and a legally incorrect statement.

As is evident from the above Table, Ohori et al does not teach a magnesium based composition containing a minimum of 6.1 wt. % aluminum and does not teach the necessity for Ca + Sr to be greater than 0.9 wt.%. Moreover, Ohori et al does not teach a minimum creep rate or a minimum tensile yield strength as set forth in claim 1. In this regard table 3 in Ohori proves otherwise. This was also confirmed in applicants declaration which clearly demonstrates that the alloys prepared according to Ohori do not provide the minimum required creep rate and produce poor castable products. Once again the Examiner assumes a 0.1% difference is "close enough". Only to the Examiner and to no one else is this difference insignificant or simply "close enough". The Examiner should instead read the reference he is relying on which proves otherwise. Ohori states in paragraph [0022] that "when the Al content exceeds 6% by weight the creep properties rapidly deteriorate". Why then would Ohori choose to exceed 6wt% which the Examiner deems to be "close enough"? The Examiner also disregards the teaching in Ohori for the addition of Si to be at a minimum of between .1% and 1wt% and preferably between .2% and .6wt%, see paragraph [0063] whereas the maximum content for Si in the subject application is 0.03 wt%.

Based upon a false premise of being "close enough" and contrary to the teaching in the reference itself, the Examiner then alleges and concludes that the

composition in Ohori overlaps the composition of the subject application. This is simply a naked statement without underlying support. A similar naked allegation is made by the Examiner regarding the intermetallic compounds being inherently possessed in the teaching of the reference. To the contrary Ohori teaches in the Abstact that only unavoidable impurities are to be included other than the balance of magnesium. Does the Examiner consider all intermetallic compounds to inherently constitute the unavoidable impurities referred to in Ohori or only those claimed in the subject application by applicant? Is this the sound basis upon which the Examiner believes the composition of Ohori is the same as that in claim 1 and upon which the Examiner cites In re Best? When Si is added in Ohori a minimum of 0.1% is necessary and preferably above .2wt% to .6wt%. This is indicative of an ambiguity in Ohori as to what element is to be included in the alloy as an "unavoidable impurity" and at what concentration. This is confirmed in the issued patent to Ohori, now US Patent No. 6,719,857, in which claim 1 excludes Si but claim 2 includes Si but only when it is within a specified range which incidentally is outside the teaching of the subject invention. In either case it clearly proves the Examiner is without support in making the statement that the intermetallic compounds as claimed are inherent in Ohori and that therefore Ohori overlaps the composition of the subject application.

Applicant is once again attaching a copy of Annex 4, inclusive of Tables 1A, 3A and 4A, which applicant refers to in his Declaration in paragraph 6, first paragraph, making a direct comparison of alloys prepared according to Ohori and the composition of the subject application to substantiate by direct factual evidence that Ohori is outside the acceptable limit for creep rate and tensile strength as set forth in claim 1. This is emphasized on page 5 of the Declaration with the second paragraph underlined. The allegation of the Examiner that this is not factual enough is without merit and is surprising since the Examiner relies only on a naked allegation as to what he believes is "close enough" even when it is contrary to the teaching in the reference.

The Examiner appears to rely solely on mathematics to determine what is "close enough". There is no case law which permits mathematics to be used as a basis to determine what is "close enough" especially when it is known to those skilled in the art that even minor differences in amounts in a magnesium based alloy composition can contribute to significantly different behaviors. To the contrary what would appear to the Examiner to be

"close enough" in the present circumstance constitutes a significant but minor difference which contributes to a significantly different behavior and different result as taught by applicant.

For all of the above reasons, the rejection of claims 1, 4-8, 12 and 14 based upon either Bronfin et al or Ohori et al should be withdrawn.

A similar rejection of the claims 1, 4-6, 11-12, 14, 15, 21 and 24-25 under 35 USC 103 as being unpatentable over USP 6,342,180 to Lefebvre et al is respectfully traversed.

Despite the broad teaching in Lefebvre covering a range of aluminum of from 1-12 wt.%, Lefebvre in Col. 2, line 44 and all of the specific examples limit aluminum to between 4.5-5.3 wt. % and does not teach or suggest the need for Ca + Sr to exceed 0.9 wt. %. Moreover, as explained by Applicant in his Declaration, Lefebvre broadly teaches nearly all practical combinations of elements by alleging that their content is optional but teaches only one example with a very narrow range of elements which does not come close to the subject invention. Unless the Examiner is alleging that it would be obvious "to try" all of the various permutations and combinations from the ranges taught by Lefebvre there is no foundation for the allegation of obviousness. There is simply no teaching in Lefebvre for one skilled in the art to determine what elements and ranges are needed to satisfy the requirements in claim 1 for creep rate and tensile strength. Accordingly, the rejection of the claims based upon Lefebvre et al, should be withdrawn.

The rejection of claims 1, 4-6, 11, 12, 14, 15, 21 and 24-25 as being obvious over EP 1127950 or JP 06200348, is respectfully traversed. The Ohori reference 2001/0023720 and EP 1127950 are derived from the same JP priority document (Ohori 2000, P2000-047661) and have essentially identical specifications.

The Examiner has not pointed to any differences between the reference EP 1127950 and Ohori et al '720, which applicant believe are identical to one another. Accordingly, all of the comments made heretofore relative to Ohori 2001/0023720 apply equally to EP 1127950.

As regards JP 06200348, it is clear from the above Table, that there is little in common between the composition of the subject invention and the reference JP '348. Moreover, the minimum content of Zn exceeds the maximum in the subject composition and that the requirement for Ca and Sr to exceed 0.9 wt. % is not taught. From the generalized teaching in JP '348 one skilled in the art could not possibly know how to select an appropriate composition to produce the creep rate and tensile strength taught in claim 1. This would constitute "guessing" not obviousness. Accordingly, the rejection of claims 1, 4-6, 11, 12 and 14 based on JP '348 should be withdrawn.

Applicant has submitted a Declaration, filed on January 13, 2005, which demonstrates that the composition of the subject invention is superior to the composition of the comparative Examples in terms of superior creep properties and being castable. Since claim 1 is now limited to a minimum creep rate in combination with a given tensile yield strength the comparative results provided by applicant in the Declaration clearly substantiate the existence of unexpected results and constitute factual evidence which the Examiner has disregarded. To the extent possible, applicant has compared examples from the cited references to the composition of applicant. However, where the reference only teaches a generalization it is not possible to provide comparative data to substantiate unexpected results. Conversely, there is no basis for the Examiner to use broad ranges to substantiate obviousness where the broad range such as e.g., in Lefebvre or JP '348 permit an almost endless number of permutations or combinations without any suggestion from either of the references as to how to select the combination which would lead to the claimed minimum creep rate and tensile strength.

For all of the above reasons, applicant has clearly demonstrated the patentability of claims 1, 4-8, 12, and 14 over the references of record.

Reconsideration and allowance of claims 1, 4-8, 12 and 14 is respectfully solicited.

Respectfully submitted,

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13576/01
M.R.I. RESEARCH & DEVELOPMENT

ANNEX 4

Table 1A. Chemical Compositions of Alloys

Alloy	Al %	Mn %	Zn %	Ca %	Sr %	RE %	Si %	Fe %	Ni %	Cu %	Be %	Zr %
Example1	4.8	0.26	0.15	0.25	1.35	0.08	0.01	0.003	0.0007	0.0005	0.0003	-
Example2	5.3	0.30	0.10	0.20	0.80	0.10	0.01	0.003	0.0006	0.0014	0.0004	-
Example3	6.1	0.25	0.40	0.20	0.90	0.20	0.01	0.003	0.0002	0.0012	0.0003	-
Example4	5.3	0.30	0.35	0.22	1.18	0.49	0.01	0.001	0.0005	0.0011	-	-
Example5	7.0	0.32	001	0.53	0.46	-	0.01	0.001	0.0008	0.0011	-	-
Example6	6.9	0.28	0.62	0.52	0.48	0.18	0.01	0.001	0.0007	0.0008	0.0004	-
Example7	7.9	0.01	0.12	0.66	0.52	0.12	0.01	0.001	0.0009	0.0011		0.01
Example8	7.9	0.31	0.64	0.68	0.55	0.16	0.01	0.002	0.0008	0.0016	-	-
Example9	8.8	0.24	0.11	0.85	0.51	0.03	0.01	0.001	0.0009	0.0014	-	-
Example10	8.5	0.28	0.72	0.95	0.25	0.08	0.01	0.002	0.0008	0.0017	-	
Example11	8.7	0.07	0.15	0.85	0.15	0.24	0.01	0.001	0.0009	0.0012	-	0.01
Example12	8.9	0.18	0.48	0.65	0.05	0.75	0.01	0.002	0.0010	0.0009	0.0003	
Example13	8.4	0.22	0.05	1.05	0.28	-	0.01	0.001	0.0008	0.0011	-	
Example14	9.1	0.22	0.60	0.80	0.55	0.06	0.01	0.001	0.0008	0.0021	-	
Comp Ex1	8.9	0.23	0.74	-	-	-	0.01	0.003	0.0007	0.0009	0.0009	
Comp Ex2	4.3	0.29	0.01	-	-	2.4	0.01	0.003	0.0008	0.0008	0.0008	-
Comp Ex3	4.4	0.31	0.05	1.4	0.1	0.25	0.01	0.003	0.0006	0.0011	0.0009	
Comp Ex4	9.4	0.19	0.54	1.3	0.45	0.05	0.01	0.002	0.0008	0.0012	0.0007	
Comp Ex5	8.1	0.24	0.15	0.8	0.85	0.12	0.01	0.003	0.0009	0.0015	0.0004	
Comp Ex6	5.0	0.29	0.57	1.02	0.12	-	0.02	0.003	0.0011	0.0015	0.0004	-
Comp Ex7	5.1	0.32	0.01	1.48	0.14	0.95	0.01	0.003	0.0009	0.0014	0.0004	-

Table 3A. Die Castability Properties

Alloy	Casting temperature [°C]	Oxidation Resistance	Fluidity	Die Sticking	Rank
Example 1	690	9.5	9	8.5	88
Example 2	690	9.5	9	9	91
Example 3	680	10	10	9.5	96
Example 4	690	9.5	9	9	92
Example 5	680	10	10	10	100
Example 6	660	10	8.5	9	91
Example 7	670	10	10	10	100
Example 8	660	10	9	9 5	95
Example 9	670	10	10	10	100
Example 10	680	10	10	9	93
Example 11	670	10	10	9.5	97
Example 12	670	10	10	9	93
Example 13	670	10	10	9.5	97
Example 14	660	10	9	9	92
Comparative Example 1	670	9 5	10	10	99
Comparative Example 2	690	8	8	9	80
Comparative Example 3	700	8	8	6	67
Comparative Example 4	670	10	10	7	80
Comparative Example 5	660	10	10	7	80
Comparative Example 6	700	9	8	6	70
Comparative Example 7	700	8	8	5	60

Table 4A. Mechanical Properties and Creep Behavior

Alloy	TYS [MPa]		UTS [MPa]	E%	CYS [MPa]		MCR . 10^9 [S^{-1}]		CR $mg/cm^2/day$
	20°C	150°C	20°C	20°C	20°C	150°C	135°C 85 MPa	150°C 50 MPa	
Example 1	145	112	250	10	144	112	1.8	1.1	1.48
Example 2	145	108	244	10	147	105	1.9	1.2	1.45
Example 3	153	116	249	9	152	118	13.6	3.2	1.40
Example 4	153	130	253	8	155	132	1.4	1.1	0.86
Example 5	166	135	275	10	167	130	4.8	1.1	1.24
Example 6	164	125	272	8	165	125	5.9	1.8	1.27
Example 7	172	140	275	8	171	138	7.1	1.5	1.01
Example 8	175	130	272	6	174	130	8.6	2.2	1.12
Example 9	178	142	262	5	178	140	6.9	1.8	0.93
Example 10	175	120	260	5	174	122	11.8	2.7	1.21
Example 11	174	121	259	5	174	122	9.4	2.5	0.98
Example 12	164	115	252	6	166	112	12.1	2.9	1.08
Example 13	178	135	260	4	177	122	7.2	1.9	0.95
Example 14	182	122	266	4	181	138	11.5	2.5	1.03
Comparative Example 1	160	105	260	6	160	105	305	61	1.31
Comparative Example 2	135	100	240	12	135	100	12.4	2.2	1.62
Comparative Example 3	143	108	235	8	142	108	7.8	2.2	1.56
Comparative Example 4	182	138	238	1	181	137	12.2	2.3	1.41
Comparative Example 5	180	141	232	1	179	142	8.3	2.1	1.43
Comparative Example 6	142	107	238	6	144	108	9.4	2.9	1.67
Comparative Example 7	144	109	232	5	143	107	7.5	2.7	1.89